Express Mail Label No. EV 318 174 172 US

Date of Mailing September 3, 2003

PATENT
Case No. GP-303673
GP-303674
(2760/114)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
APPLICATION FOR UNITED STATES LETTERS PATENT

INVENTOR(S): STEVEN J. ROSS
STEPHEN C. HABERMAS

TITLE: METHOD AND SYSTEM FOR IMPLEMENTING VEHICLE PERSONALIZATION

ATTORNEYS: ANTHONY LUKE SIMON, ESQ.
GENERAL MOTORS CORPORATION
LEGAL STAFF
MAIL CODE: 482-C23-B21
300 RENAISSANCE CENTER
P.O. BOX 300
DETROIT, MICHIGAN 48265-3000
(313) 665-4714

METHOD AND SYSTEM FOR IMPLEMENTING VEHICLE PERSONALIZATION

PRIORITY

This application claims priority as a continuation-in-part application to United States Patent Application serial number 10/193,799 filed July 12, 2002, the entirety of which is incorporated by reference herein.

FIELD OF THE INVENTION

This invention relates generally to wireless communications with a mobile vehicle. More specifically, the invention relates to a method and system for implementing parameter and function modifications of components within a mobile vehicle.

BACKGROUND OF THE INVENTION

The opportunity to personalize features in a mobile vehicle is ever increasing as the automobile is being transformed into a communications and entertainment platform as well as a transportation platform. Many vehicles now have hundreds of personalization settings such as seat and mirror behavior, door lock/unlock behavior, radio station present selections, climate controls, custom button configurations and theft alarm settings. With projections that by 2006 almost all new American cars will have some level of telematics service, most vehicles will support customization or personalization of wireless vehicle communication, networking, maintenance and diagnostic services.

Controller systems may be configured or updated in a manner similar to software updates. Even liquid crystal (LCD) displays on the dashboard may be reconfigurable with changes on which data is on the center screen and which is relegated to side panels. For example, it is possible to rearrange dashboard displays for the speedometer, global positioning system (GPS), map navigation, cell phone, two-way radio, maps, radio presets, and mirror and seating behavior settings.

Many of these personalization settings are non-intuitive vehicle-only interfaces, such as, for example requiring a user to set them through a dashboard display or a combination of key fob button strokes. The present invention advances the art of vehicle personalization.

SUMMARY OF THE INVENTION

One aspect of the invention includes a method for providing vehicle settings to a telematics unit in a mobile vehicle. The method includes receiving a vehicle settings update signal at a call center from the telematics unit and sending vehicle settings from the call center to the telematics unit.

In accordance with another aspect of the invention, a computer readable medium storing a computer program includes: computer readable code for processing a received vehicle settings update signal from the telematics unit and computer readable code for sending vehicle settings from a call center to the telematics unit.

In accordance with yet another aspect of the invention, a system for providing vehicle settings for a telematics unit in a mobile vehicle is provided. The system includes means for receiving a vehicle settings update signal at the call center from the telematics unit. Means for sending vehicle settings from the call center to the telematics unit is also provided.

The aforementioned, and other features and advantages of the invention will become further apparent from the following detailed description of the presently preferred embodiments, read in conjunction with the accompanying drawings. The detailed description and drawings are merely illustrative of the invention rather than limiting, the scope of the invention being defined by the appended claims and equivalents thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates one embodiment of a system for personalizing settings of an in-vehicle telematics unit and associated components, in accordance with the current invention;

FIG. 2 illustrates another embodiment of a system for personalizing settings of an in-vehicle telematics unit and associated components, in accordance with the current invention;

FIG. 3 is a block diagram illustrating a system for providing vehicle settings for a telematics unit and associated components in a mobile vehicle in accordance with one embodiment of the present invention;

FIG. 4 is a flow diagram of one embodiment of a method of personalizing settings for an in-vehicle telematics unit and associated components, in accordance with the current invention;

FIG. 5 is a flow diagram of another embodiment of a method of personalizing settings for an in-vehicle telematics unit and associated components, in accordance with the current invention; and

FIG. 6 is a flow diagram of yet another embodiment of a method of personalizing settings for an in-vehicle telematics unit and associated components, in accordance with the current invention.

DETAILED DESCRIPTION OF THE
PRESENTLY PREFERRED EMBODIMENTS

FIG.1 illustrates one embodiment of system for personalizing settings of an in-vehicle telematics unit and associated components, in accordance with the present invention at **100**.

Vehicle personalization system **100** for personalizing settings of an in-vehicle telematics unit and associated components includes a mobile vehicle **110**, a vehicle communication bus **112**, a telematics unit **120**, one or more wireless carrier systems **140**, one or more communication networks **142**, one or more land networks **144**, one or more client, personal or user computers **150**, one or more web-hosting portal **160**, and one or more call centers **170**. In one embodiment, mobile vehicle **110** is implemented as a mobile vehicle equipped with suitable hardware and software for transmitting and receiving voice and data communications.

Telematics unit **120** includes a digital signal processor (DSP) **122** connected to a wireless modem **124**, a global positioning system (GPS) unit **126**, an in-vehicle memory **128**, a microphone **130**, one or more speakers **132**, and an embedded or in-vehicle mobile phone **134**. In one embodiment, DSP **122** is implemented as a microcontroller, controller, host processor, or vehicle communications processor. In another embodiment, DSP **122** is implemented as a processor working in conjunction with a central processing unit (CPU) performing the function of a general purpose processor. In an example, the CPU is implemented as a XScale™ processor available from Intel® Corp. of Santa Clara, CA. GPS unit **126** provides longitude and latitude coordinates of the vehicle. In-vehicle mobile phone **134** is a cellular-type phone, such as, for example an analog, digital, dual-mode, dual-band, multi-mode or multi-band cellular phone.

DSP **122** executes various computer programs that control programming and operational modes of electronic and mechanical systems within mobile vehicle **110**. DSP **122** controls communications between telematics unit **120**, wireless carrier system **140**, and call center **170**. In one embodiment, a voice-recognition application is installed in DSP **122** that can translate human voice input through microphone **130** to digital signals. DSP **122** generates and accepts digital signals transmitted between telematics unit **120** and a vehicle communication bus **112** that is connected to various electronic modules in the vehicle. In one embodiment, these digital signals activate the programming mode and operation modes, as well as provide for data transfers. In this embodiment, signals from DSP **122** are translated into voice messages and sent out through speaker **132**.

Mobile vehicle **110**, via a vehicle communication bus **112**, sends signals to various units of equipment and systems within mobile vehicle **110** to perform various functions such as unlocking a door, opening the trunk, setting personal comfort settings, and calling from telematics unit **120**. In facilitating interactions among the various communication and electronic modules, vehicle communication bus **112** utilizes bus interfaces such as controller-area network (CAN), International Organization for Standardization (ISO) Standard 9141, ISO Standard 11898 for high-speed applications, and ISO Standard 11519 for lower speed applications.

Mobile vehicle **110**, via telematics unit **120**, sends and receives radio transmissions from wireless carrier system **140**. Wireless carrier system **140** is implemented as any suitable system for transmitting a signal from mobile vehicle **110** to communication network **142**.

Communication network **142** includes services from one or more mobile telephone switching offices and wireless networks. Communication network **142** connects wireless carrier system **140** to land network **144**. Communication network **142** is implemented as any suitable system or collection of systems for connecting wireless carrier system **140** to mobile vehicle **110** and land network **144**.

Land network **144** connects communication network **142** to user computer **150**, web-hosting portal **160**, and call center **170**. In one embodiment, land network **144** is a public-switched telephone network. In another embodiment, land network **144** is implemented as an Internet protocol (IP) network. In other embodiments, land network **144** is implemented as a wired network, an optical network, a fiber network, other wireless networks, or any combination thereof. Land network **144** is connected to one or more landline telephones. Communication network **142** and land network **144** connects wireless carrier system **140** to web-hosting portal **160** and call center **170**.

Client, personal or user computer **150** includes a computer usable medium to execute Internet browser and Internet-access computer programs for sending and receiving data over land network **144** and optionally, wired or wireless communication networks **142** to web-hosting portal **160**. Personal or user computer **150** sends user preferences to web-hosting portal through a web-page interface using communication standards such as hypertext transport protocol (HTTP), and transport-control protocol and Internet protocol (TCP/IP). In one embodiment, the data includes directives to change certain programming and operational modes of electronic and mechanical systems within mobile vehicle **110**. In operation, a driver utilizes user computer **150** to initiate setting or re-setting of user-preferences for mobile vehicle **110**. User-preference data from client-side software is transmitted to server-side software of web-hosting portal **160**. User-preference data is stored at web-hosting portal **160**.

Web-hosting portal **160** includes one or more data modems **162**, one or more web servers **164**, one or more databases **166**, and a bus system **168**. Web-hosting portal **160** is connected directly by wire to call center **170**, or connected by phone lines to land network **144**, which is connected to call center **170**. In an example, web-hosting portal **160** is connected to call center **170** utilizing an IP network. In this example, both components, web-hosting portal **160** and call center **170**, are connected land network **144** utilizing the IP network. In another example, web-hosting portal **160** is connected to land network **144** by one or more data modems **162**. Land network **144** sends digital data to and from modem **162**, data that is then transferred to web server **164**. Modem **162** may reside inside web server **164**. Land network **144** transmits data communications between web-hosting portal **160** and call center **170**.

Web server **164** receives user-preference data from user computer **150** via land network **144**. In alternative embodiments, user computer **150** includes a wireless modem to send data to web-hosting portal **160** through a wireless communication network **142** and a land network **144**. Data is received by land network **144** and sent to one or more web servers **164**. In one embodiment, web server **164** is implemented as any suitable hardware and software capable of providing web services to help change and transmit personal preference settings from a driver at user computer **150** to telematics unit **120** in mobile vehicle **110**. Web server **164** sends to or receives from one or more databases **166** data transmissions via bus system **168**. Web server **164** includes computer applications and files for managing and storing personalization settings supplied by the driver, such as door lock/unlock behavior, radio station present selections, climate controls, custom button configurations and theft alarm settings. For each user, the web server potentially stores hundreds of preferences for wireless vehicle communication, networking, maintenance and diagnostic services for a mobile vehicle.

In one embodiment, one or more web servers **164** are networked via bus system **168** to distribute user-preference data among its network components such as database **166**. In an example, database **166** is a part of or a separate computer from web server **164**. Web server **164** sends data transmissions with user preferences to call center **170** through land network **144**.

Call center **170** is a location where many calls are received and serviced at the same time, or where many calls are sent at the same time. In one embodiment, the call center is a telematics call center, prescribing data and/or verbal communications to and from telematics unit **120** in mobile vehicle **110**. In an example, the call center is a voice call center, providing verbal communications between an advisor in the call center and a subscriber in a mobile vehicle. In another example, the call center contains each of these functions. In other embodiments, call center **170** and web-hosting portal **160** are located in the same or different facilities.

Call center **170** contains one or more voice and data switches **172**, one or more communication services managers **174**, one or more communication services databases **176**, one or more communication services advisors **178**, and one or more bus systems **180**.

Switch **172** of call center **170** connects to land network **144**. Switch **172** transmits voice or data transmissions from call center **170**, and receives voice or data transmissions from telematics unit **120** in mobile vehicle **110** through wireless carrier system **140**, communication network **142**, and land network **144**. Switch **172** receives data transmissions from and sends data transmissions to one or more web-hosting portals **160**. Switch **172** receives data transmissions from or sends data transmissions to one or more communication services managers **174** via one or more bus systems **180**.

Communication services manager **174** is any suitable hardware and software capable of providing requested communication services to telematics unit **120** in mobile vehicle **110**. Communication services manager **174** sends to or receives from one or more communication services databases **176** data transmissions via bus system **180**. Communication services manager **174** sends to or receives from one or more communication services advisors **178** data transmissions via bus system **180**. Communication services database **176** sends to or receives from communication services advisor **178** data transmissions via bus system **180**. Communication services advisor **178** receives from or sends to switch **172** voice or data transmissions.

Communication services manager **174** provides one or more of a variety of services, including enrollment services, navigation assistance, directory assistance, roadside assistance, business or residential assistance, information services assistance, emergency assistance, and communications assistance. Communication services manager **174** receives service-preference requests for a variety of services from the user via user computer **150**, web-hosting portal **160**, and land network **144**. Communication services manager **174** transmits user-preference and other data to telematics unit **120** in mobile vehicle **110** through wireless carrier system **140**, communication network **142**, land network **144**, voice and data switch **172**, and bus system **180**. Communication services manager **174** stores or retrieves data and information from communication services database **176**. Communication services manager **174** may provide requested information to communication services advisor **178**.

In one embodiment, communication services advisor **178** is implemented as a real advisor. In another embodiment, communication services advisor **178** is implemented as a virtual advisor. In an example, a real advisor is a human being in verbal communication with a user or subscriber in mobile vehicle **110** via telematics unit **120**. In another example, a virtual advisor is implemented as a synthesized voice interface responding to requests from telematics unit **120** in mobile vehicle **110**.

Communication services advisor **178** provides services to telematics unit **120** in mobile vehicle **110**. Services provided by communication services advisor **178** include enrollment services, navigation assistance, real-time traffic advisories, directory assistance, roadside assistance, business or residential assistance, information services assistance, emergency assistance, and communications assistance. Communication services advisor **178** communicate with telematics unit **120** in mobile vehicle **110** through wireless carrier system **140**, communication network **142**, and land network **144** using voice transmissions, or through communication services manager **174** and switch **172** using data transmissions. Switch **172** selects between voice transmissions and data transmissions.

Mobile vehicle **110** initiates service requests to call center **170** by sending a voice or digital-signal command to telematics unit **120** which in turn, sends an instructional signal through wireless modem **124** or a voice call through wireless carrier system **140**. The instructional signal and voice call are routed through communication network **142**, and land network **144**, to call center **170**.

FIG. 2 illustrates another embodiment of a system of personalizing settings for an in-vehicle telematics unit, in accordance with the current invention. The vehicle personalization system **200** comprises one or more mobile vehicles **210**, one or more wireless carrier systems **240**, one or more user computers **250**, one or more web-hosting portals **260**, and one or more call centers **270**.

A driver, subscriber or user of a mobile vehicle utilizes personal or user computer **250** to access the website of web-hosting portal **260**. The website comprises web pages organized by vehicle function, features available on a particular vehicle model, part of the vehicle needing service update, last updated user preference or any other convenient and user-friendly way of presenting the current settings of user preferences and options for changing those preferences. The server-side software secures information through user identification

numbers, vehicle identification numbers, passwords, or any other identification process to insure that a person is an authorized user of a telematics service to a particular vehicle.

Options are presented in an organized manner for easy selection, for example, by clicking a radio button, check box, selection box or drop-down menu. In one embodiment, server-side and optionally client-side form validation are used to prevent the user from selecting unavailable, incorrect, or conflicting options of preferences. Examples of user preferences include seat behavior preference, a mirror behavior preference, a door lock behavior preference, a radio station preset selection preference, a climate setting preference, a button configuration preference, and a theft alarm setting preference, as well as other preferences and user options in an ever-increasing list of telematics and vehicle services.

In one embodiment, after new preferences have been selected, the user is asked to verify new preferences and user identification again before the web-hosting portal **260** sends the final selections to call center **270**.

In another embodiment, after new preferences have been selected and the user has verified new preferences and user identification, the telematics unit of mobile vehicle **210** is queried to determine a download status of the mobile vehicle **210**. In an example, the download status is a fixed status requiring the mobile vehicle maintain a stationary period for a predetermined fixed time period. In this example, certain new preferences, such as, for example modifying power train behavior (e.g. sport transmission shifting preference), seat behavior (e.g. remote exit preference) and mirror behavior (e.g. mirror to cub in reverse preference) include a requirement for a predetermined stationary period for implementation of the modification. In one embodiment, the download status is determined based on the ignition status of the mobile vehicle. In another example, the download status is a variable status requiring the mobile vehicle maintain a stationary period for a predetermined variable time period depending

on the new preferences. In this example, certain new preferences, such as, for example modifying radio pre-sets include a requirement for a very limited stationary period or no stationary period for implementation of the preference.

If the download status of the telematics unit of mobile vehicle **210** is negative (e.g. the telematics unit inactive or the mobile vehicle is unable to maintain a stationary position for a specified time period), the preferences are stored for later transmission.

The web-hosting portal **260** sends user-preference information to the communication services manager of call center **270**. The call center processes a telematics service request with updated user preferences to the mobile vehicle via a combination of one or more types of networks and wireless carrier system **240**.

The telematics unit of mobile vehicle **210** receives the updated user-preference information, and activates the functions that send signals to electronic controllers and equipment to change vehicle parameters and service settings that correspond to the user preferences sent to the vehicle. In an example, the user-preference information includes seat-position, mirror-adjustment, radio-preset, dashboard-display, cell-phone and temperature-control settings that can be set before a driver ever enters a vehicle.

The system depicted in **FIG. 2** also illustrates the path of updated user-preference information being transmitted from mobile vehicle **210** to call center **270** via wireless carrier system **240**. In one embodiment, a driver is able to change one or more user preferences at mobile vehicle **210** where functions are activated to change vehicle parameters and settings to correspond to user preferences. The updated user-preferences are sent back to call center **270** for storage, such as, for example in a database. In another embodiment, a driver accesses information on the latest user-preference updates from web-hosting portal **260** via an Internet-connected personal computer **250**. In yet another embodiment, user preferences are stored at the user or personal computer **250** based on user input at mobile vehicle **210**.

FIG. 3 is a block diagram illustrating a system **300** for providing vehicle settings for a telematics unit in a mobile vehicle. System **300** includes a system server **310** and a vehicle client **320**. System **300** may include additional components not relevant to the present discussion.

Server **310** is a server-side system that includes web-client application **311**, modem bank **312**, application server **330**, and database **360**. In one embodiment, server **310** is implemented as an OnStar® call center, such as, for example call center **170** of **FIG. 1** above. Web-client application **311** is a portal allowing access to/from server **310** from outside sources, such as, for example the Internet and the World Wide Web. In one embodiment, web-client application **311** is implemented as an end user website, such as, for example web-hosting portal **160** of **FIG. 1** above. Modem bank **312** allows server **310** to access vehicle client **320**.

Vehicle client **320**, also referred to as a telematics unit, includes a vehicle communication services (VCS) application **390** and vehicle bus **321**. In one embodiment and referring to **FIG. 1** above, VCS application **390** operates within telematics unit **120**. VCS application **390** is a software framework that receives proprietary over-the-air messaging schemes and passes a vehicle setting update including updated vehicle settings to vehicle bus **321** for execution. In one embodiment, vehicle bus **321** executes the updated vehicle settings on components coupled to the vehicle bus, such as, for example a vehicle telematics unit, a vehicle personalization module, or a vehicle radio. VCS application **390** transmits to server **310** as well. In one embodiment, VCS application **390** communicates with server **310** as described in **FIG. 1**, above. VCS application **390** includes alert manager **391**. Alert manager **391** manages the various sending/receiving of communications between vehicle client **320** and server **310**. In one embodiment, alert manager **391** provides an interface allowing a user to communicate a request for a previously provided vehicle setting update to be transmitted from application server **330** to vehicle client **320**.

In another embodiment, alert manager **391** provides an interface notifying a user previously provided vehicle settings are ready to be transmitted from application server **330** to vehicle client **320**.

Application server **330** is an Internet/World Wide Web application server operating within server **310** that facilitates operation of software applications operating within application server **330** as well as providing conduits into and out of application server **330**. In one embodiment, application server **330** is implemented as a WebLogic application server available from BEA™ Systems, INC. of San Jose, CA. Database **360** receives and stores data from as well as locates and sends requested data to application server **330** and related applications operating within application server **330**. In one embodiment, database **360** stores user profile information, such as, for example service-level information and vehicle type information including vehicle specific data as well as other relevant information discuss below. Database **360** may be implemented as any suitable database application, such as, for example Oracle® Database available from Oracle® Corp. of Redwood Shores, CA.

Application server **330** includes portal application **340**, common services application **370**, and communication services application **380**. Application server **330** further includes personal portal **331**, portal skin **332**, voice portal **333**, and remote administrative portal **335**. Personal portal **331** and remote administrative portal **335** are web-based software frameworks that allow interaction between a client and an application operating within application server **330**. In one embodiment, personal portal **331** provides interaction between a customer and an application operating within application server **330** via the Internet/World Wide Web. In this embodiment, portal skin **332** functions to provide mapping to a specific user profile and provides links to specific applications within portal application **340** based on predetermined criteria, such as, for example a service-level subscription and vehicle type. In another embodiment, administrative portal **335** provides interaction between a call center advisor and an application

operating within application server **330** via an intranet. In this embodiment, operation within an intranet reduces security concerns by promoting call center advisor communication directly with portal application **340**.

Voice portal **333** is a voice-based software framework that allows interaction between a client and an application operating within application server **330** via communication components with portal application **340**, such as, for example voice channel access port **341** and wireless channel access port **342**. In one embodiment, voice portal **333** provides interaction between a customer and an application operating within application server **330** via a wireless carrier system. In this embodiment, portal skin **332** functions to provide mapping to a specific user profile and provides coupling to specific applications within portal application **340** based on predetermined criteria, such as, for example a service-level subscription and vehicle type. In an example, portal skin **332** operates in conjunction with voice portal **333** as a voice-activated menu allowing the customer to interact with specific applications within portal application **340** based on predetermined criteria, such as, for example a service-level subscription and vehicle type. In operation, utilizing system **300** allows a customer to interact with specific applications within portal application **340**, such as, for example to request an update, called a vehicle settings update signal, of vehicle preferences.

Portal application **340** is a web-based software framework that creates interaction between a client and an application operating within the portal application. Portal application **340** includes voice channel access port **341**, wireless channel access port **342**, voice personalization portlet **345**, web personalization portlet **346**, and shared components **350**. Voice channel access port **341** and wireless channel access port **342** are access ports that allow additional access avenues to portal application **340** for a client. In one example, voice channel access port **341** allows access to portal application **340** by a client via a voice channel device, such as, a cellular phone or other voice activated

telecommunications device. In this example, voice channel access port **341** includes a voice XML gateway that includes automated speech recognition (ASR) software for facilitating communication with a user. In another example, wireless channel access port **342** allows access to portal application **340** by a client via a wireless device, such as, for example a Short Message Service (SMS) device or a Wireless Application Protocol (WAP) device.

Portlets (**345** and **346**) are applications that interact with a client and provide a client access to specific services based on predetermined criteria, such as, for example a service-level subscription and vehicle type. In one embodiment, the portlets make use of the portal software framework connection to application logic behind the user interface to allow execution of desired services. In an example, a portlet includes Java Server Pages (JSPs), webflows, and input processors to enable a client to access and interact with the portlet. In this example, if predetermined criteria have been met (e.g. security criteria), voice personalization portlet **345** provides a client access to her account, such as, for example to request a download to update vehicle settings. In another example, web personalization portlet **346** makes use of the portal software framework connection to application logic behind the graphical user interface (GUI) to allow execution of desired services. In an example, based on the service-level subscription and vehicle type, web personalization portlet **346** allows the client (e.g., the customer in this example) to enter portal application **340** via personal portal **331** and portal skin **332**, and access web personalization portlet **346** to update vehicle settings.

Additionally, portal application **340** may include other applications, such as, for example an application that would notify a user of an update awaiting download by transmitting an update flag signal to a vehicle client. In one embodiment, the vehicle client **320** receives an update flag signal from portal application **340** via application server **330** at the alert manager **391** and notifies the client of the waiting vehicle setting update. In another embodiment, portal application **340** passes the update flag signal to shared components **350** for transmission to vehicle client **320** as described below.

Shared components **350** is an interface layer that collects portlet information and produces vehicle setting updates request, also referred to as vehicle service message requests. In one embodiment, shared components **350** produces a request object including vehicle setting updates and streams the request object to common services application **370** as described in **(OnStar#GP-303672/CLG#2760.113)** filed on September 3, 2003.

Common services application **370** is a web-based software framework that supports interaction between applications operating within common services application **370** and applications operating within other web-based software frameworks, such as, for example portal application **340** and communication services application **380**. Common services application **370** includes vehicle message service (VMS) application **371** that receives the request object from shared components **350**, produces a vehicle setting update request, and streams the vehicle setting update request to communication services application **380**. In one embodiment, VMS application **371** receives the request object from shared components **350**, produces a vehicle service message request (i.e., a vehicle setting update request), and streams the vehicle service message requests to communication services application **380** as described in **(OnStar#GP-303672/CLG#2760.113)** filed on September 3, 2003

Communication services application **380** is a software framework that supports interaction between applications operating within communication services application **380** and applications operating within web-based software frameworks, such as, for example common services application **370**. Communication services application **380** includes vehicle session manager (VSM) application **381** that receives a vehicle setting update from VMS application **371** and passes the vehicle setting update to modem bank **312** for transmission to vehicle client **320**. In one embodiment, VSM application **381** receives the vehicle service message request (i.e., a vehicle setting update) and passes the vehicle setting update to modem bank **312** for transmission to vehicle client **320** as described in **(OnStar#GP-303672/CLG#2760.113)** filed on September 3, 2003

In operation, updated vehicle settings are received via web-client application **311** and personal portal **331**, voice portal **333**, or remote administrative portal **335**, in conjunction with portal skin **332** to access portlets (**345** and **346**). In one embodiment, updated vehicle settings are referred to as user-preference information. Shared components **350** creates a vehicle setting update request that is streamed to VMS application **371** within common services application **370**. VMS application **371** produces vehicle setting update that is streamed to VSM application **381**. VSM application **381** passes the vehicle setting update to modem bank **312** for transmission to vehicle client **320**.

FIGS. 4-6 are flow diagrams of embodiments of a method of personalizing settings for an in-vehicle telematics unit. In **FIGS. 4-6**, methods **400**, **500**, and **600** may utilize one or more systems detailed in **FIGS. 1-3** above. The present invention can also take the form of a computer usable medium including a program for configuring an electronic module within a vehicle. The program stored in the computer usable medium comprises computer program code for executing the method steps described in **FIGS. 4 – 6**. In **FIG. 4**, method **400** begins at block **410**. Blocks in **FIGS. 5** and **6** that are numbered identically to blocks in **FIG. 4** function in a substantially similar way.

At block **420**, a vehicle settings update signal is received. In one embodiment, the vehicle settings update signal is received at a call center, such as, for example call center **170** described in **FIG. 1** above. In another embodiment, the vehicle settings update signal is received at application server operating within a server from a telematics unit. In an example and referring to **FIG. 3**, the vehicle settings update signal is received at application server **330** operating within server **310** from vehicle client **320**. In this example, the vehicle settings update signal is implemented as a voice signal that enters voice portal **333** of application server **330** to reach voice portlet **345** within portal application **340** as described above. Alternatively, the vehicle settings update signal is implemented as a voice signal that enters voice channel access port **341** or a data signal that enters wireless channel access port **342** of portal application **340** to reach portlets (**345** and **346**) within portal application **340** as described above.

At block **430**, vehicle settings are sent from the call center to the telematics unit. In one embodiment, vehicle settings are sent from the call center, such as, for example call center **170** described in **FIG. 1** above, to the telematics unit, such as, for example telematics unit **120** described in **FIG. 1** above. In an example and referring to **FIG. 3** above, shared components **350** creates a vehicle setting update request that is streamed to VMS application **371** within common services application **370**. VMS application **371** produces vehicle setting update that is streamed to VSM application **381**. VSM application **381** passes the vehicle setting update to modem bank **312** for transmission to vehicle client **320**.

In another embodiment, sending the vehicle settings from the call center to the telematics unit includes determining a download status of the telematics unit, storing the vehicle settings when the download status of the telematics unit is negative, and transmitting the vehicle settings from the call center to the telematics unit when the download status of the telematics unit is positive. In an example and referring to **FIG. 1** above, vehicle settings are sent from the call center **170** to telematics unit **120** when the telematics unit is active.

In another example and referring to **FIG. 3** above, vehicle client **320** is in bi-directional communication with application server **330**. In this example, voice portal **333** (via voice channel access port **341** within portal application **340**) provides interaction between a customer as well as vehicle client **320** and an application (e.g. voice personalization portlet **345** within portal application **340**) operating within application server **330** via a wireless carrier system to determine the download status of VCS application **390** and hence the download status of the telematics unit that VCS application **390** operating within. An example of determining the download status of the telematics unit includes transmitting at least one download requirement to the telematics unit, receiving a download reply from the telematics unit responsive to the at least one download requirement, and determining a download status of the telematics unit based on the received download reply.

An example of a download requirement includes an active telematics unit and the active telematics unit monitoring a plurality of associated components and their statuses, such as, for example, a vehicle personalization module, a vehicle radio, a transmission status, or an ignition status of the vehicle, for example an ignition status of accessory/remote accessory power (RAP). In this example, the download requirement ensures that components within the telematics unit and the vehicle are in a state allowing for modification.

If the download status of the telematics unit is negative (e.g. the telematics unit is inactive or the telematics unit is active but associated components are in an unmodifiable state), portal application **340** instructs shared components **350** to transfer the vehicle setting update request to database **360** for storage. If the download status of the telematics is positive (e.g. the telematics unit active and components are in a modifiable state), portal application **340** instructs shared components **350** to stream the vehicle setting update request to VMS application **371** as described in **FIG. 3** above.

Further, if storage is required, the step of storing the vehicle setting update request includes determining a store status for the vehicle settings when the download status of the telematics unit is negative, storing the vehicle settings when the store status is positive, and deleting the vehicle settings when the store status is negative. In an example and referring to **FIG. 3**, the step of determining the store status includes voice portal **333** providing interaction between a customer as well as vehicle client **320** and an application (e.g. voice personalization portlet **345** within portal application **340**) operating within application server **330** via a wireless carrier system.

At optional block **440**, the updated vehicle settings within the vehicle setting update are implemented within the vehicle client. In one embodiment and described in **FIG. 3** above, VCS application **390** passes the vehicle setting update to vehicle bus **321** for implementation.

At block **450**, the method ends.

In **FIG. 5**, method **500** includes optional block **515** in addition to blocks **410 – 450** described in **FIG. 4** above. At block **515**, a user preference is received at a call center. In one embodiment, user preferences in the form of updated vehicle settings are received via a web-client application and a personal portal, a voice portal, or a remote administrative portal, in conjunction with a portal skin to access portlets. In an example and referring to **FIG. 3** above, user preferences in the form of updated vehicle settings are received via web-client application **311** and personal portal **331**, voice portal **333**, or remote administrative portal **335**, in conjunction with portal skin **332** to access portlets (**345** and **346**).

In **FIG. 6**, method **600** includes optional block **615** in addition to blocks **410 – 450** described in **FIG. 4** above. At block **615**, an update flag signal is sent to the telematics unit. In one embodiment, the telematics unit, also referred to as a vehicle client, receives an update flag signal from a portal application via an application server at an alert manager and notifies the client of the waiting vehicle setting update. In an example and referring to **FIG. 3** above, vehicle

client **320** receives an update flag signal from portal application **340** via application server **330** and through modem **312** at alert manager **391** and notifies the client of the waiting vehicle setting update. In another embodiment, the portal application passes the update flag signal to shared components interface layer for transmission to a vehicle client. In an example and referring to **FIG. 3** above, portal application **340** passes the update flag signal to shared components **350** for transmission to vehicle client **320**.

The above methods (**400**, **500**, and **600**) may be further combined to form a method including the steps of method **400** as well as block **515** of method **500** and block **615** of method **600**. In one embodiment, the resultant method would include receiving a user preference at a call center and transmitting an update flag signal to the telematics unit prior to execution of the steps of method **400**.

The above-described methods and implementation for providing vehicle settings for a telematics unit in a mobile vehicle are example methods and implementations. These methods and implementations illustrate one possible approach for providing vehicle settings for a telematics unit in a mobile vehicle. The actual implementation may vary from the method discussed. Moreover, various other improvements and modifications to this invention may occur to those skilled in the art, and those improvements and modifications will fall within the scope of this invention as set forth in the claims below.

The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive.